

TECHNICAL TOPICS

Airports Division

FAA Central Region

Number: EDC-01

Subject: Temporary Runway Surface Transitions

Issue Date: 12/1/98

Last Revision: 12/1/98

1. **General**

This handout provides guidance for temporary surface transitions on runways. Transitions are often necessitated by the need to stage or phase construction of runway surfaces. The depth and spacing between transitions or bumps can affect both the navigational control of aircraft and the potential for damage to the aircraft landing gear.

The Boeing Company has evaluated runway roughness criteria and provided guidance for acceptable minimum criteria to avoid damage to Boeing and McDonnell Douglas aircraft.

2. **Reference**

The Boeing Company
AC 150/5370-2

3. **FAA Coordination**

Coordinate with appropriate FAA Airports Engineer.

RUNWAY SURFACE TRANSITIONS

An often overlooked detail during runway resurfacing is the design of temporary transitions. These transitions (bumps) are often necessary to accommodate construction sequencing or unexpected delays in construction. Figure 1 and figure 2 provide minimum criteria for “Temporary Transition” and temporary surface transition ramp slope requirements as provided by the Boeing Company. Boeing developed these transitions from runway roughness criteria based on the capability of the Boeing 707, 727 or 737 to encounter bumps at or near rotation speed without damage to the landing gear itself, or the effected landing gear parts. Since the merger of the Boeing Company with McDonnell Douglas, the transition criteria has been determined equally acceptable for Boeing or Douglas aircraft. It is the opinion of the Boeing Company that these criteria would be acceptable for all commercial jet aircraft.

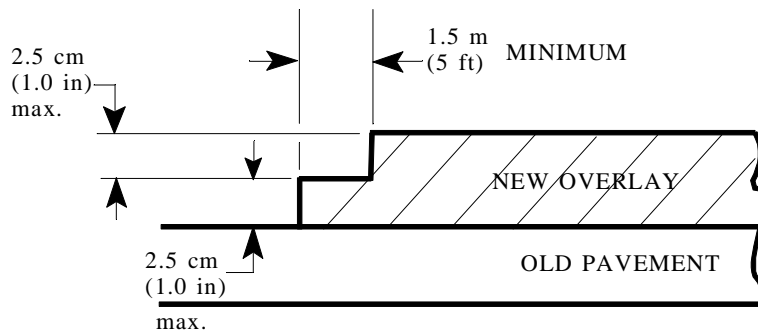
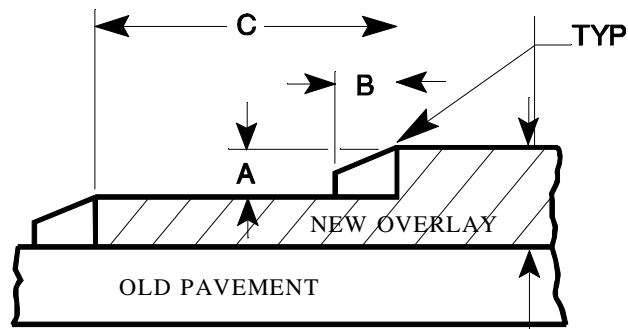
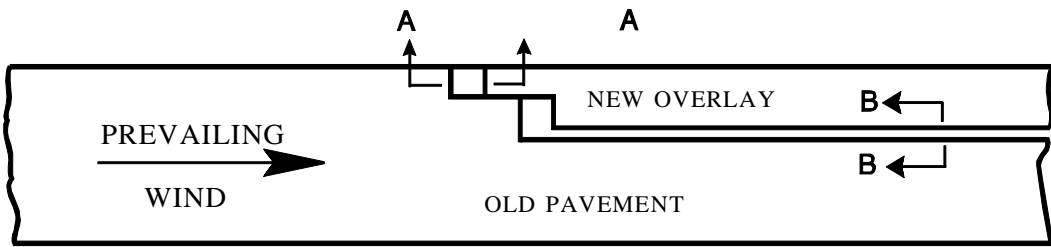
Figures 1 and 2 are intended to show minimum overlay steps for new construction, however, the same slopes and steps would be applicable for depressions created by milling existing surfaces.

Section A-A on Figure 1 depicts a step equivalent to a continuous ramp as specified in Figure 2. Minimum step dimensions and spacing are specified in the table on Figure 1. The advantage of the continuous ramp is the elimination of the flat section shown as dimension “C” on Figure 1. If a continuous ramp is desired, a slope of 1 to 100 should be selected for lifts up to 2 inches deep and a slope of 1 to 200 should be used for temporary ramps where the lifts are 2 to 4 inches deep.

In the direction parallel to travel (Section B-B on Figure 1) either construct 1 inch steps with the spacing shown, or construct a continuous slope of no more than 1 to 60. The 1 to 60 side slope will create the same effect as the step, yet still be acceptable to a pass of an aircraft main landing gear. In general, Boeing recommends that construction be performed in such a way as to avoid necessitating any of the side slope provisions within the central 100 feet of the runway.

Due to the importance of the runway surface condition to safe operation of aircraft, the airport should set up a pre-construction meeting with all of the air carriers to carefully denote the planned areas and sequencing of construction. A detailed construction plan should also be provided to the carriers, on a daily or weekly basis throughout the construction process. The construction plan should specify what to expect, and where along the runway to expect unique runway surface conditions. The plan, or any necessary updates, should also contain any temporary surface slopes that may exist on any given day or week during construction. NOTAM's should indicate where along the runway a temporary ramp exists, whether it is an up ramp or a down ramp relative to one threshold direction, and whether there are cross ramps (side slopes) in the center 100 feet of the runway. NOTAM's should be updated with each change in the runway surface condition.

RUNWAY RESURFACING TEMPORARY SURFACE TRANSITIONS



Courtesy of Boeing Company

MINIMUM LENGTHS		
A	B	C
2.5cm (1.0 in)	1.0 m (3 ft)	3.7m (12 ft)
3.8 cm (1.5 in)	2.5m (8 ft)	9.0m (30 ft)
5.0 cm (2.0 in)	4.5m (15 ft)	18m (60 ft)

FIGURE 1

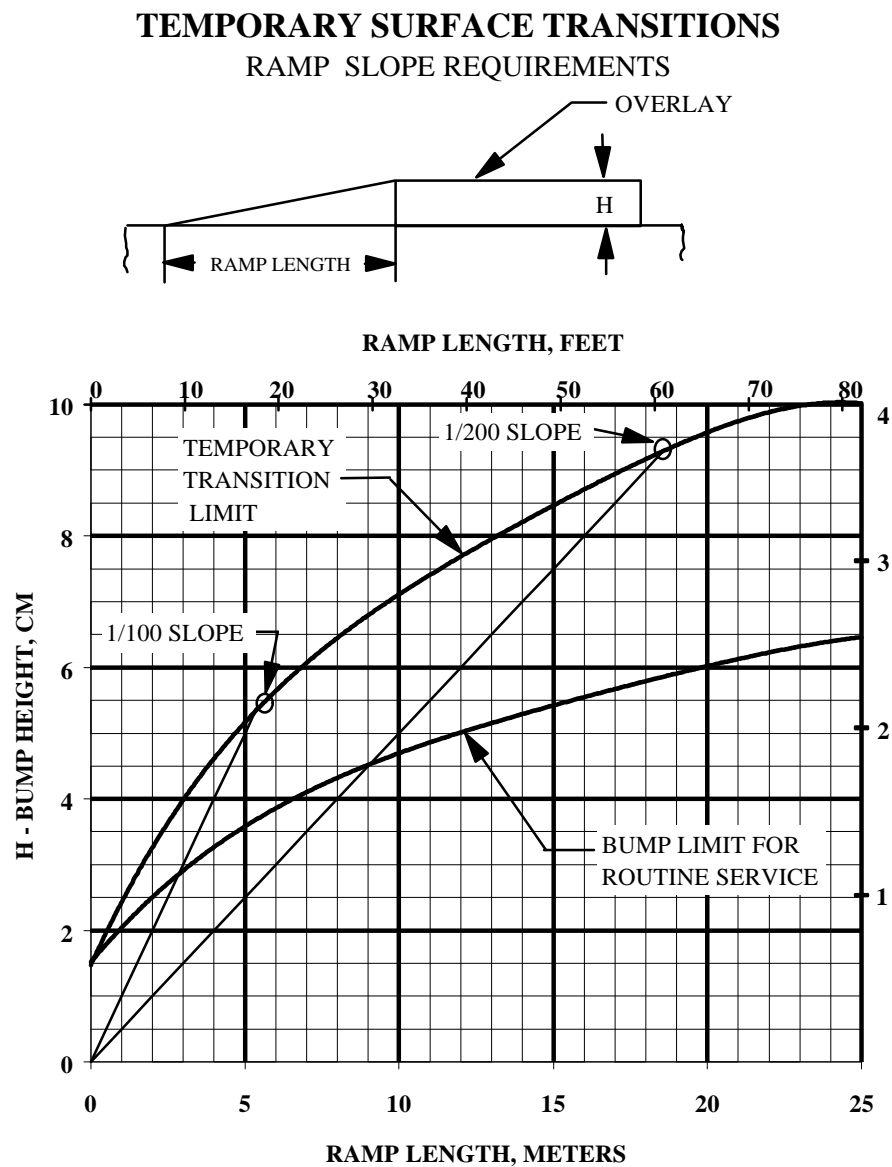


FIGURE 2